

*Among a number of
safety-improving technology transfers
is a new inflatable liferaft that
represents a major advance in
equipment for sea emergencies*

Spinoff For Survival

The Givens Buoy Raft, shown in a hangar prior to Elizabeth City tests, has an unusual hemispheric underside, designed to prevent capsizing in rough water. The design is similar to that of a NASA raft developed for stable performance in astronaut recovery after ocean landings.

Operating off Kodiak, Alaska, the 82-foot fishing boat *Credence* recently overturned in high seas. Fortunately, its crew of six had time to board a uniquely-stabilized, inflatable liferaft known as the Givens Buoy Raft. One of the crewmen had particular cause to appreciate the value of the new Givens raft. On a previous occasion, he had been forced to abandon another fishing vessel which carried conventional flat-bottom inflatable rafts. The raft flipped over as he at-

tempted to board it and he was saved only by the timely arrival of a rescue helicopter.

The Givens Buoy Raft cannot be overturned, its manufacturer claims and others concur. An independent test group conducted a series of demonstrations and found that every type of raft except the Givens could be capsized either by one man boarding or several shifting weight within the raft. Termed by the group "a remarkable stability achievement," the Givens Buoy raft offers the first major advance in inflatable survival equipment in many years. It is a spinoff product resulting in part from NASA technology and in part from years of research by Jim Givens, president of Res-Q-Raft, Inc., of Lake Worth, Florida and Seattle, Washington.

NASA used inflatable rafts to transfer astronauts returning from space between their ocean-landed spacecraft and a recovery ship. NASA found a problem in the use of conventional flat-bottom inflatables; they tended to overturn when exposed to the down-draft from helicopters of the recovery fleet. So Johnson Space Center developed a new and highly-effective method of raft stabilization for which NASA secured a patent. Working separately, Jim Givens came up with a very similar system. He subsequently patented his own invention and secured an exclusive patent license to use the NASA technology.

Many seagoing vessels, particularly fishing boats, use inflatable liferafts as primary survival equipment. U.S. Coast Guard approval of American-built rafts requires certain stability measures, such as stabilizing water bags or "pockets." But there is a question as to whether these devices are adequate, considering that most vessel abandonments occur under severe weather conditions. Foremost among the hazards is the possibility that inflatables may capsize in rough water either before boarding, during boarding or from weight shifts after evacuees have boarded. The rafts may also flip under the pressure of rotor downwash when helicopters are employed in the rescue operation. Additionally, an inflatable dropped into heavy seas may part its tie-line and float out of reach before crewmen can board it.

The Givens Buoy Raft, the basic model of which has a capacity of four to six persons, was designed in re-





sponse to these hazards. The design eliminates the conventional limited-ballast water bags. In their stead is one large hemisphere-shaped underwater ballast chamber which provides exceptional stability. The chamber has a "flapper valve" that admits 4,800 pounds of water ballast. The ballast chamber moves *with* the wave action and thus, says inventor Givens, the raft cannot overturn even if all the occupants shift to one side. The ballast chamber also keeps the raft from blowing away in high winds. An additional feature is the raft's ability to right itself if it is accidentally inflated upside-down.

Some manufacturers of conventional rafts say that no improvements are needed on Coast Guard-approved inflatables. The Coast Guard, however, is not sure about that; officials have been following closely the Givens development and they are considering the possible necessity for upgrading raft stabilization standards.

Last October, at Elizabeth City, North Carolina, the Coast Guard conducted a series of stability tests on several rafts—including Givens'—of varying size

and design. That was part of a comprehensive test and study program, still under way, of the performance and effectiveness of inflatable survival equipment. It could result in a new set of standards.

Meanwhile, the Givens Buoy Raft is finding wide acceptance among operators of fishing boats and other vessels. It has also won a nod of approval from the fishing industry publication *National Fisherman*. Reporting on a survey of expert opinion as to the relative merits of different inflatables, the publication stated: "There is a definite consensus that the Givens raft is the most suitable for the greatest variety of likely conditions."

At Elizabeth City, North Carolina, several inflatable liferafts of various designs await their turns for stability testing. The tests were conducted last year as part of a new Coast Guard study of inflatable survival equipment.

Pictured during Coast Guard tests, these Givens inflatable rafts (photos below and at right) demonstrate their stability, maintaining level attitudes despite water turbulence created by powerful helicopter rotor downdrafts that reach velocities of 80-100 knots.



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In this underwater view, the diver is examining the "flapper valve" of the Givens Buoy Raft. The valve admits water to the large hemispheric ballast chamber, key to the raft's exceptional stability.